

## Geochemical and temporal evolution of the St Martin magmatic system (Lesser Antilles)

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### Contexte

The Lesser Antilles is a slow-subducting island arc located at the northern tip of South America. The arc underwent a bifurcation at ~9 Ma, whereby magmatism in the north of the arc transgressed westwards, leaving a series of extinct, Oligocene-age volcanic islands. One such example is the island of St Martin. It is host to an extensive intrusive and extrusive volcanic rock record including exposed plutonic basement, hypabyssal dykes and sills, and basic to intermediate lava flows. These units provide an excellent insight into the magmatic history of the Oligocene-age portion of the Lesser Antilles arc.

However, the geochemical and temporal relationships between the various volcanic units are poorly constrained. This study will use petrography, geochemistry and geochronology to unravel the magmatic history of St Martin, including the duration of the magmatic system.

### Objectifs et Méthodes

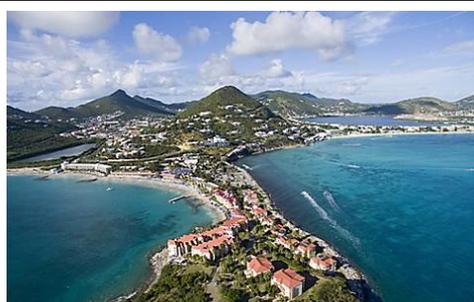
This project provides an excellent opportunity to work within a scientifically diverse petrology department at the University of Geneva including the integration with other students studying the magmatism of the Lesser Antilles islands. It aims to look at the geochemical and temporal relationships between intrusive and extrusive products, in a poorly-studied magmatic system, using a multidisciplinary approach. This will require techniques such as:

- Fieldwork
- Optical microscopy of magmatic products
- Whole rock and mineral chemistry (X-ray Fluorescence, Electron microprobe, Laser Ablation Inductively Coupled Mass Spectrometer)

Fieldwork on St Martin in March 2021 with the aims of acquiring targeted field samples and to understand the geological history of the island in context.

### Bibliographie

*Davidson, J.P., Boghossian, N.D. and Wilson, M., 1993.* The geochemistry of the igneous rock suite of St Martin, northern Lesser Antilles. *Journal of Petrology*, 34(5), pp.839-866. *Frey, H.M., Manon, M.R., Brehm, S.K. and Babiak, R.N., 2018.* Episodic crystallization in young explosive eruptions in Dominica, Lesser Antilles, revealed by U-Th dating of zircons. *Geology*, 46(10), pp.887-890.



Volcanic island of St Martin, Caribbean

### Sites WEB

<http://www.unige.ch/sciences/terre/en/research/petrology-and-volcanology/>

### Orientation du Master suggérée : (supprimer les orientations qui ne conviendraient pas)

Geochemistry, Alpine tectonics, Ore Deposits